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Hearing and Dancing Beats: An Interartistic Appropriation of Meters in Greek Tragedy and Brazilian Traditional Dances

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In this paper we propose a plural approach to ancient Greek music by philological analysis, digital sound technology, and choreographic investigation. Our aim is to construct a model to expose the performative horizon that is found in the text. In order to do that, we proceed from a textual and metrical analysis first. The results from this analysis are processed by a DAW (Digital audio workstation). After this, some audio files are provided and submitted to dance improvisation. In the last part of this research, there is a comparative analysis between Greek rhythms and Brazilian traditional dances.

Keywords: ancient Greek music, sound studies, metrical description, dance studies, Brazilian traditional dances

Introduction

When it concerns the Greek tragedy, the loss of music is a well-known lament. Ironically, this chant has become increasingly common exactly at a time when new readings of the Greek tragedy seek to highlight the performative dimension of the texts. In other words, as it becomes more consolidated that the remnant texts of the Athenian drama are closely interrelated as far as the questions of composition, realization, reception, and production of the dramatic-musical works, it is exactly the question of sound that is left out. The frailty of this particular music and of music as a whole is established as the starting point and as a foresight: There is no way of restoring which is no longer and which exists only at the moment of its execution.

As can be seen, the feeling of a lost music is directly related to two factors: the impossibility of accessing the original contexts of sound production and the inexistence of complete documents that would have preserved the original melodies. In this paper, we propose alternatives to this negativity with the aim of providing scholars and artists with an interpretation methodology of the design of metrics, thus subsidizing future academic and/or aesthetic projects that go beyond the lament for the loss of music in the ancient Greek drama.

In order to achieve that, it becomes necessary to return to the texts themselves in an attempt to see them as documents of dramatic-musical practices whose metrical designs enable us to perceive activities which are musically oriented.

To start with, I will review concepts about the formal structure of the Greek tragedy, highlighting its arrangement of parts and its distribution of specific soundscapes based on metrical design. In addition, and still within the same scope, we will follow on to the analysis of the formal structure of Aeschylus's *The Suppliants* as a means of exemplifying the correlation which is between the distribution of the parts and the metrical

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arrangement. Going still further on this question, we centre our attention on the Parodos of *The Suppliants* and present its metrical configuration which is firstly transcribed in traditional music notation and then sonically simulated in a DAW.

After a discussion of these initial data, we go on to develop an experiment: The rhythms which are described in the scansion are accompanied by dance, recorded and undergo a spectrographic analysis so as to pinpoint their frequency outlines. In the sequence, after the discussion of the data raise from the analysis of the spectrogram, we discuss two performances of the metrical data and their sound simulations, enhancing aspects of the reception of this material.

Finally, new material based on Brazilian traditional dances is provided in order to clarify the materiality of ancient rhythm by using comparative bias.

The Formal Structure of the Greek Tragedy

The formal structure of a Greek tragedy reveals the fact that there is a meaningful alternation between sections and metrical profiles which are very different one from the other.[1] The relationship between the formal structure and the metrical design allows us to understand about such alternation: We are speaking about the organization of a dramatic-musical event from the point of view of the exploration of its sound density. Therefore, there are sections or parts with sound mass reduced and others with sound mass enlarged. The Athenian playwright could count on diverse manners for dealing with the amounts of sound sources and the effects of this manipulation. One thing is a monovocal context, that is, one person speaking aloud. Another, completely different, is a group of twelve to fifteen people singing and dancing together. So as to delimit the uses of sound density, there are sections with specialized meters. Thus, in the spoken parts, one finds a characteristic type of rhyme, whereas in the dancing/singing parts, besides the musical accompaniment, one finds a diversity of metrical arrangements. Therefore, sound density is related to the homogeneity or heterogeneity of the metrical arrangement.

In observing the metrical arrangements presented in a tragedy, one can identify the practice of producing variations in the distribution of verses in the spoken parts assigned to the drama agents within a mono-metrical context. This way, the episodes in a tragedy are sections which can be distinguished aurally one from the other by keeping continuity in the metrical profile and assigning different amounts of verses to the different drama agents. The mono-metrical orientation found in these sections delimits the horizon of the dynamic of exchanges between the clusters of speech.

In other words, even in a context of rhythmic uniformity, one can still find a creative use of the sound mass which can be reduced by means of the play between the limits of speech. Thus, in a sequence, the distribution of speech creates which the sung parts, simultaneously, realize. The constructivism of the speech re-establishes the density of the chorus sections. Despite the absence of musical accompaniment or a robust sound mass, the spoken parts are elaborated according to extensive procedures from the chorus constructivism. Therefore, the continuous rhythm of the mono-metrics found in the spoken parts is diversified in the plural rhythm of the distribution of speech clusters.[2] This is about the rhythm of the distribution of the verses applied

[1] V. Aristotle *Poetics, XII,* e Hephaestion *PeriPoiêmatos.*

[2] An example of that is the prologue of Aeschylus's *Seven Against Thebes*: A succession of three clusters of speech present: (1) Eteocles starts the spectacle with a speech of 38 verses that urges the polis to react to a coming attack; (2) Comes in the spy who, in 30 verses, destroys the certainties enunciated by Eteocles; (3) In the end, Eteocles, alone and in just nine verses, prays that all goes well. The decrease in number of the king's speech lines marks the rhythm of the challenge to his hegemony.

to the rhythm of the verse. As such, mono-metrics is not equivalent to monotony. That which is in focus is the extension and duration of the clusters of speech. As regards the sung/danced parts, they are presented not only with several combined meters, but also in several arrangements of distribution of the meters, followed by musical accompaniment, thus broadening the sound density of these sections.

A third modality lies in the coming together of monometrical and heterometrical sections: Rhythmic profiles which were previously presented separately and now are presented simultaneously are assigned to diverse agents or groups of agents. The possibility of making co-present seemingly exclusive metrical profiles shows the versatility of the Athenian playwright in dealing with expectations from sound marks. Upon the collision of the metrical profiles, as a single performance space is shared at a same time, the frontiers between the parts and their designs are reviewed, manifesting the inclusion of the differences and of the sections in a range of sound to which and from which everything converges and diverges. The same effort and dedication spent in delimiting the parts with different rhythmic guidance is further opposed to the movement of eroding the boundaries through the juxtaposition of markings and prior expectations.

What one finds in a tragedy, therefore, are some parts or sections which are organized within a homogeneous rhythmic context by means of the dynamics of amount and duration of the clusters of speech; some others that express a diversity of rhythms and of distribution of sets of verses; and still others that involve the different metrical profiles and groups of verses in an intense and simultaneous clash of markings and rhythmic expectations.

The Table 1 below illustrates the discussion above:

Table 1
Formal Structure of Greek Tragedy

Parts	**Metrics**	**Delivery mode**	**Agents**	**Musical accompaniment**
Prologue	Trimeter Iambic	Speaking	Characters	No
Parodos	1-anapaests; 2-Several meters	1-Chanting 2-Singing/Dancing	Chorus	Yes
Episodes	Trimeter Iambic	Speaking	Characters (Coryphaeus)	No
Stasimon	Several meters	Singing/Dancing	Chorus	Yes
Mixed (amoibaion, Kommos, duets, Epirrhema)	Several meters	Speaking Singing/Dancing	Chorus Characters	Yes

Parodos in Aeschylus's *The Suppliants*

As an example of this formal structure, we turn to Aeschylus's *The Suppliants*. In the Table 2 below one finds the first section of the play:

Table 2
Structure of The Suppliants' Parodos

Sections	**Meter**	**Delivery mode**	**Agents**	**Musical accompaniment**
Parodos	1-anapaests (1-39) 2-Strophic Song/dance (40-175)	1-Chanting 2-Singing/dancing	Chorus	Yes
First Episode	Trimeter Iambic	Speaking	Characters and Chorus (Coryphaeus)	No

The opening of the play presents a section divided in two parts: The women chorus enters the scene and establishes the links between the audience's reality and the events involving the escape that they embark on as

they come from Egypt to Argos; following that, the women chorus performs their pleas to Zeus through an organized form of singing/dancing. Such information is conveyed through the text content and through the metrical design: The first part of the entrance of the chorus (1-39) manifests itself by means of systems of anaepests and the second part manifests itself in diverse meters within a strophic composition.

Let us turn the focus to the first part of the Parodos. To do so, the first verses, after a metrical scansion, are presented as follows:

(1) Ζεὺς μὲ-νἀ-φίκ-τωρ/ἐ-πί-δοιπρο-φρό-νως 2 an
- u u - - u u - u u -
(2) στό-λο- νἠ-μέ-τε-ρον/νά- ι -ο-νἀρ-θέντ’ 2 an
u u - u u - - u u - -
ἀ-πὸ-προσ-το-μί-ων /λεπ- το-ψα-μά-θων 2 an
u u - u u - - - u u -
Νεί- λου. Δί-αν/δὲ λι-ποῦ-σαι paroem
- - - - uu - - //
(3) χθό- να σύγ- χορτον/Συ-ρί-ᾳ φεύ-γο-μεν, 2 an
uu - - - u u - - u -
οὔ-τι-ν’ἐ-φ’αἵ-μα-τι /δη-μη-λα-σί-αν 2 an
- uu - u u - - u u -
ψή-φῳπό-λε-ως/γνωσ-θεῖ-σαι, paroem
- - uu - - - - //

It seems that the anapaest is the most simple of the meters, and it is frequently associated to a march or to a shift in scene. It is organized in times, uniform proportion, génosísos, as it places a long in front of two short, totaling four moras. In the case reported here, understanding the meter is not restricted to its temporal dimension. The accents indicate other information: At any given moment, there is a greater intensity or volume. Thus, there are two sets of data within the same text and two registers of different sound parameters.

To make it explicit how these two parameters differ and overlap, one needs another notation. I apply the same passage to a traditional musical notation, ascribing to the first line the temporal order of the durations, recorded in the long and short syllables of the text; and to the second passage the order of intensity, of volume, that appears in the accents:

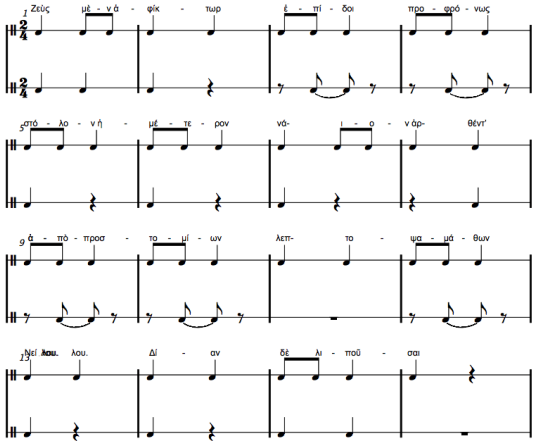

Figure 1. Rhythm score.

As can be noted, in some moments there is the synchrony between the temporal order of the durations and the volumetric order of the accents. But this is not the rule: The regularity of the anaepestic rhythm gives way to the asynchronies between time and intensity. Such data, so relevant for performance, are not noticeable in a scansion that favors information of temporal order. Taking into account the context of the play, such asynchronies embody the ambivalences of women who show themselves as fragile, but not capable of killing. The rhythmic movement of the durations is accompanied by the counter rhythmic movement of the intensities, leading to a reenactment of the sound and visual information as regards the performance of the chorus. The audiovisual scope of the chorus, with its contradictions and complexities, can be perceived only when it exceeds a reading practice that sees the meters as prearranged schemes, without any questions as regards the context of its production. In that case, so that this more complete audiovisual image could be identified, it was necessary to follow by stages, inserting the initial metrical description into another notation, thus allowing for the separation of the audio parameters.

However, as one speaks of meters, it is necessary to take a step ahead. What if we could listen to this rhythmic notation? Therefore, as we assign sounds of handclaps to the order of times as well as sounds of footsteps to that of intensities, it should be possible to follow the convergence and divergence movements between parameters. That is what we have done, shifting the traditional notation of meters in sound products by means of a DAW such as the Cubase. At a first moment, I tried several different outputs, such as the voice or a pad. Finally, I wrote down each note, one after the other, according to a new translation of metrical scansion. Thus, through technological mediation, I wrote the sounds and listened to the metrified writing.

Such experience provides the listener with another type of contact with the meter when compared to the silent reading of the written page or to the reading aloud of the metrified text. There is a decentralization of the verbal language, with sound being just sound in its materiality. Thus, the heard meter, the sound reinforced rhythm is, from the beginning, independent information in itself, and a new source for later recreations. Even keeping some of its elements away from its early context of production, such as pulse, temporal values, and synchronizing points, the sonifying meters led themselves to re-use, to openness to new ventures.

This decentralization of the sound was enlarged with the new experiment: What if I, myself, recorded the sound of my feet stamping on the ground, the metrical scansion of anaepestic entrance, and the sound of my feet, side by side with the voice reciting the same excerpt, and then compared the resulting archives in a spectrogram?

In the diagram below, one can see the spectrogram of my steps on the ground, following the rhythm indicated on the metrical scansion of the anaepestic opening of *The Suppliants:*

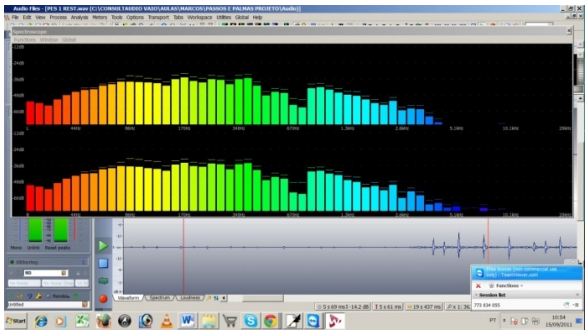

Figure 2. Spectrogram of step sounds.

In the diagram, one can see the frequencies presented in a step taken on the ground as someone dances the meter. In red, one can see the low pitch frequencies; in green, the middle pitch ones; and in blue, the high pitch ones. When the sandal is stamped on the ground, the acoustic result is the presence of high frequencies of the material of the sandal and the low frequencies of the foot, now a resonator. These peaks in the bass and in the treble represent the extreme frequencies as regards the step, the percussion produced by the dancer's body. Note the hole or decline in the midrange, in green.

In the next image, we find a frequency spectrogram related to another situation: Not only do I stamp on the ground with the feet but also recite the text, both in the rhythm of the meter. Therefore, feet and voice are presented at the same time:

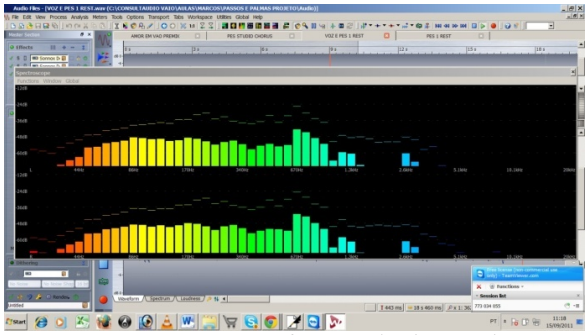

Figure 3. Spectrogram of steps and voice together.

Note how the green area which is indicative of the midrange is covered, in this instance, with sound peaks.

In other words, the sound produced by the feet is not something minor or insignificant when compared to the voice. The bodily percussion, that is, the body that resounds in the movement on the ground, projects an involving sound for the performance. The extreme bass and treble frequencies give space to the perception of that which will be vocally enunciated. Thus, a Greek tragedy exploits the scope presented by sound range in terms of the diverse frequencies it reverberates in the acoustic space of the theatre. One of the misunderstandings inherent in the lament about the supposedly loss of music in the Greek tragedy is the idea that music is only a melody. Before anything else, there is sound, and sound coming from different sources and registers. The rhythmic richness present in the text also expresses a broad spectral scope.

With that, we enter an area which has been little exploited by the academic reception of the tragedy. For instance: After reviewing contemporary reception of Greek music, Wolf criticizes the presence of percussive sounds. According to him, "in original music of Greek drama percussion played no part at all" (Wolf, 2010, p. 289).

This view shares a long tradition that privileges vocal/melody sound as a model to music making (Kartomi, 1990; Bundrick, 2005; Di Giglio, 2009; West, 1994).

In this paper I propose a non-verbocentric approach to ancient Greek stage music, by amplifying the concept of "percussion": Not only musical instruments can be percussive, but also human bodies (Duffy, Waitt, Gorman-Murray, & Gibson, 2010; Blades, 2005).

For, beyond the sounds of feet and words together, we find other modalities of bodily percussion, such as the use of hands and the vocal percussion, presented in the form of alliterations and interjections. In 1980,

Olsen proposed a review in the classification of instruments: idiophone, membranophone, etc. Olsen, also, argued in favor of what he called “corpophone”.

The exercise as suggested above has been an individual reciting a text while dancing. Now, just imagine a whole chorus. Even when considering the limited scope of the exercise above, see the following table:

Table 3

General Sound Production in a Chorus

Items	**Individual**	**Group**
Quantity	One person: one mouth, two feet.	Twelve people: 12 mouths, 24 feet.
Musical accompaniment	No	Yes
Movements (choreography)	No	Yes (aulos)
Audience response/interaction	No	Yes

As can be seen, a single person is recorded reciting and dancing the text and the parodos rhythm of *The Suppliants,* with only one source of sound that produces different sounds within a broad scope of frequencies, and yet we get a reduced texture or density of the event. Furthermore, other sources and other sonorities are left out, as far as musical accompaniment and other feasible bodily percussion. In order to broaden still further this acoustic context of expanded sound performance in scene, one should take into account the fact that because both the rhythms and the melodies are arrangements known to the audience, they can, most likely, respond to them, thus doubling the audiovisual capacity of the chorus. A sound responds to another sound. A broad and noisy performance would take over the performative space in the Greek tragedy. It is necessary to go beyond our audience upbringing inherent in the Italian theatre, with the segregation between the behaviors of the audience and the dramatic agents. Such isolation is based on the premise of the disregard for sound and, again, of the centrality of the spoken word: One must be quiet and remain silent so as to follow the verbal acts of others. At least in Aeschylus, taken from what is informed by Aristophanes in *The Frogs,* the sound material comes from previous materials, stylemes of known ritual performances. If it were not for that, there would be no place for the musical-dramatic parodies by Aristophanes. It is a fundamental resource of Athenian playwriting to be able to hear external sounds in the theater. And to respond to them is to produce a physical action to physical acts performed on the stage by the dramatic agents.

In face of this other dimension, I wanted to investigate how the Greek meters could be worked from the point of view of audition, by people who in fact deal with the integration between body and rhythm in performative artistic contexts. From my acquaintance with my colleague, Cinthia Nepomuceno, from the Instituto Federal de Brasília, I could carry out the following experiment with her dance students: The *The Suppliants'* parodos sound files were introduced to them as incentive for movement. At a first moment, these students responded to the sounds they heard without any previous information as to how the materials had been produced or even as to any details about Aeschylus’s play. As can be observed on video 1, the response of the students to the metrified sounds led them to get in a grouping formation, all the members seeking to perform the same movements together. In addition, as a group, they moved about in a march, advancing with steps of alternate feet. This regular motion of the feet is followed by keeping the central support, the axis and the arms of the dancers. Putting it another way, they synchronize their time and their bodies in line with the sound information they are exposed to. The performance of the group is anchored on the information related to the meter. It is an attempt at establishing a match between the rhythms and the intensities found in the sound file

and the body dynamics: For each note, the dancers propose a step. In fact, this play with symmetries and correspondence may be understood as follows: each syllable according to its duration and to a step. This way, we end up with different materials and expressive acts seeking to translate the same reference. But it must be remembered that these are only estimates of the relationship between sound, temporal datum, and physical response. It is only within the context of an attempt at homogenization that a step can be "equated" to duration.

At a second moment, the dancers were again encouraged by the same sonorous meters, but with the difference that, this time, they had been informed of details about the production of the sound files as well as the context of the text from which the meters had been extracted. In video 2, we can observe a new attitude, a greater freedom of movements on the part of the dancers: Besides not trying to work on the assumption of a direct match between sound and choreography, the dancers introduced movements and bodily arrangements which kept a closer relation to the textual references rather than to the rhythms present in the text.

We come to the point where we have now two different approaches to a single problem, that is, how to materialize a Greek chorus. In the first case, a more sound-oriented one, the restricted knowledge led the dancers to respond to aural stimuli straight away, without taking into account the figures or the visuality of the material. The strategy thus adopted has been that of proposing a bodily response to bodily information. As a result, they acted the same way as an audience who danced to that which they listen to.

As to the second case, the response of the same audience/interpreter happened in a straight relation to the information found in the content of the text: characters, plot, and themes. This is a traditional literary approach that subsidizes the performative acts. In face of this information, the interpreters chose to separate the movements from the sound sequence of events so as to be able to build a visual plot of occurrences. The experience of belonging to a group and to a chorus remains. But it fills a secondary place in face of a protagonist who plays the part of the male character in the play (king and/or father). The choreography follows a known grammar of movements which positions the chorus as a receptacle of the protagonist figure. This dependence of the chorus on visuality underpins its peripheral positioning.

That is to say that the two approaches present not only different strategies, but also different assumptions of reception and construction of interpretative situations. It is quite interesting to observe that the shift in perception of the sound leads to distinctive bodily dynamics. We are still working on extremes—between an attempt at reproducing the sound data and at reproducing, more exclusively, the visual data. The audiovisual characteristics of text are accessed dichotomously.

In any case, there is a creative endeavor, a reworking of the data presented either by sound stimuli or by verbal clarification. The pressing issue is how to interrelate creativity as a global, integrative apprehension of audiovisuality in the tragic texts.

I believe that making both the scholars' and the artists' assumptions explicit will allow for new solutions for this integrative demand. Insofar as the awareness about the performativity of the text evolves, more and better will become the interpretation attached to them, whether it takes the form of essays or of art. In face of what has been exposed, a metrics which is contextualized and produced aurally will have much to contribute here.

Choreoanalysis

Four dances were selected for analysis on this research: the *syrtós*, the demonstration "*Homer Dance*"[3]

[3] See http://youtu.be/ldZ6PwViiH8.

and two Brazilian folk dances the "ciranda" and the "coco". The *syrtós* is a typical Greek round dance, very popular until modern days, whose rhythm is the same as described by ancient music experts (David, 2006, p. 103). This rhythmic association has inspired Amirthanayagam David and his choreographer partner Miriam Rother to compose artistical performances. "*Homer Dance*" is one of those compositions.

The option of analysing Brazilian cultural expressions was made because of our cultural backgrounds and of the wealth of the artistic manifestations in our country.The "ciranda" was a choice because of its similarities with the *syrtós*. This cultural expression is simultaneously music and dance as well as the *syrtós*. The melody is conducted by a lead singer and followed by a choir of "cirandeiros" who perform a round dance, by the sound of percussion instruments that set the rhythm. The "ciranda" is most frequently found on the NorthEastern States of Brazil. The beat of the feet is associated to the Brazilian native indigenous dances and the musical style is mentioned as a portuguese heritage (França, 1992, p. 51). The "coco" is a dance that is usually practiced with the ciranda and there are two theories that mix both manifestations:

(1) the ciranda is a kind of rest for the coco dancers, so it would be part of the coco; (2) the ciranda conceals the coco because the coco is a repressed expression and needs to dodge the repression (Ayala & Ayala apud Teller, 2009, p. 75).

Telma Cavalcanti has defined coco as a "poetic-musical-choreographic genre" (1996, p. 20). This popular artistic manifestation is composed by movement, music, and sung poetry. It can be found in many States of the Brazilian NorthEastern with diferent designations: "bambelô, coco-de-ganzá, samba-coco, baile do supapo, zambê etc". The writer and ethnologist Edison Carneiro has mapped what he called the "zone of the coco: the States of Ceará, Rio Grande do Norte, Paraíba, Pernambuco and Alagoas" (apud Teller, 2009, p. 70). There are also different styles of cocos: "loose coco", "turned coco ", coco "changed ou changeof partner", coco "with partnership", and coco "inrows" (ibid.). Despite the differences in the use of space and group configuration, all of those styles of cocos maintain the same steady step. Cavalcanti has interviewed residents of rural communities and concluded that this strong beat of the feet was related to the collective work of leveling the floor of wattle and daub of homes (1996, pp. 29-30).

The following analysis may help to investigate the relationship between dance music and text from different cultural origins. The four distinct artistic manifestations were analysed in their choreological aspects looking for similarities and singularities. For this purpose the Movement Theory of Rudolf Laban was used: the "eight basic effort actions" (Laban, 1978, p. 117), the "four effort factors" (ibid, p. 126), and "the three basic sensations" corresponding to each one of the "two fundamental sensations of the movement" (ibid, pp. 122-3). Two of the "sixteen basic movement themes" (Laban, 1975, p. 25) were selected: the Theme I—awareness of the body and the Theme V—adaptation to a partner.

Syrtós and Laban

The "eight basic effort actions" of Laban's Movement Theory are: wring, press, slash, flick, glide, float, thrust, and dab. The observation of a variety of the *syrtós* dance presentations resulted in some notes: The dancers of the choir have frequently used the action of glide in the space and of dabbing their feet; the soloists have wrung their arms and/or their torso, and they also have used the action to slash the air with a scarf; if the dance is agitated, they tend to thrust with their feet. The actions of press and float were never observed during the analysis of the *syrtós*.

The "four effort factors" are: weight, time, space, and flow. Analysing the weight factor of the *syrtós*

dance, it is possible to observe different graduation of power (from light to strong), relaxed and tense movements. This happens mostly because of the actuations of the soloists. There are oscillations in the muscular effort required by the dancers. Sometimes they use light weight, other times strong weight. However, if the typical movement of the *syrtós* is considered, which is the dancing of the choir that alternates one movement that glides and two movements that dabs, the conclusion is that the predominant weight effort factor is lightness. Glide and dab are actions that require light force.

Regarding to the time factor on the *syrtós* the variation is between normal and sustained. Sometimes the soloists make sudden movements. But considering again the typical steps of the choir, there is one sustained (glide) added to two normal (dab) movements. The analysis of space is made to observe directions, plans, extensions, and pathways. The group dislocation is to the right, sometimes right-forwards and right-backwards; the plan used by the group is high, but sometimes a soloist may dance in a lower plan; analysing the extension factor it is possible to see that the group keeps it close and some soloists move in normal extension from the group; the pathway is always curve.

The flow factor is composed by the elementsflux, action, body, and control. The dancers bodies are in constant movement; they never stop. The actions of the group are "continuous", but some movements of the feet are "jerky". The flux of the group is "going" and never "arresting", and some of the movements of the feet are " jerky" and consequently the flux is "interrupting". The control of the movement is "normal" during almost all the dancing execution, but sometimes this control can become "interrupting" during the dances of the soloist.

The "two fundamental sensations of the movements" of the Laban's Movement Theory are "levity/lightness" and "dropping". During most of the observation of the dancing of the *syrtós*, the sensation is of lightness. The "three basic sensations" associated to the lightness are: relaxed, excited, and elated. The conclusion of the analysis is that the relaxed sensation is predominant.

The basic movement themes were created by Rudolf Laban based on Basic Principles of Human Movement and are part of his book *Modern Educational Dance* (1975). The Theme I is related to body awareness. The analysis of the *syrtós* brought up some information about this theme: The guiding parts of the dancers bodies are their feet; the body parts in contact are the hands; the shifting of the weight of the body is always done from left to right, alternating right-forwards and right-backwards (and it never changes even if the left foot guides the movement—this occurs because the group is dislocating to the right, so the body is used in asymmetry with emphasis in the right).

The Theme V is related to partnership in dance and in the *syrtós* which is executed as "doing the same" (every member of the choir in a high plan, doing exactly the same movement of the feet, hand in hand), "dancing together" (when a soloist is the partner of someone of the choir) and "dancing for partners" (when the soloists dance to the choir). The configurations "dialogues in movements" (complementarities and variety movements with partners) and "trios, quartets, and quintets" (division of the group in small groups that dance together) were absent.

Choreoanalysis of the"Homer Dance"

There are two different parts that need to be analyzed separately on the presentation "Homer Dance". The first one is the group scene and the second one is a scene with a choir and two soloists. The first one has two "basic effort actions" of the feet: thrusting and dabing. The second, however, introduces on the dance of the

soloists the actions of wring, slash, and glide, and they also thrust. The group remains dabbing their feet. On both scenes, the actions of pressing, floating, and flicking are absent.

The predominant weight factor in both scenes is composed by tense and emphatic movements. The strong weight is present most of the time, despite of some light actions of the soloists. The time of the movements is almost always sudden, although sometimes movements are executed in normal time in the second scene.There is a curve pathway in the use of the space during all the first scene and a straight pathway during all the second scene. The extension of the space is normal in the first scene and has a variation between normal and far in the scene 2. The high plan is used by the group in the first scene and by the choir during the second scene, but the soloists stay on the high plan most of the time of scene 2, but do some movements on the medium plan and a few ones on the low plan. The direction of the scene 1 is to the right, alternating right-forwards and right-backwards. On scene 2 the direction is forwards, but the soloists make some variations because of their acrobatics, so they use all possible directions in relation to their own axes.

The flow of the bodies of the dancers on the first scene is continuous. The movement of their feet are jerky and there is a stop of all the group after the beginning of the scene, before they start to dance in circle. The control of the movements is intermittent and the flow is interrupted. In the second scene the soloists take their positions, movements, series of positions, with normal, intermitent, and complete control. There are complete, jerky, and stopped actions; the flux is going, interrupting, and arresting. They actually use all the elements of the flow during the scene 2. Meanwhile the choir stays steady, in complete control, in continuous action of dabbing their feet with an interrupting flux. This causes a contrast because the choir is using only one element of the flow factor while the soloists are using all of the elements. The conclusion is that the choir's flow is bound and the soloists' is free.

The "fundamental sensation of the movements" during the two scenes is "dropping" and the basic sensation is "stimulated". The three basic sensations related to the "dropping" are: stimulated, sinking, and collapsing. The second scene shows many elements of the first theme of movement related to body awareness: stretch, bend, and twist the body, immobility and actions that are complementary and asymmetric. The soloists run, roll, jump, lift, squat, turn, and never do the same movement with the other side of the body. They only touch each other one time, on their arms. The shift of their body weights are constants and variables: from one foot to another, from one foot to the same, from two feet to one foot, from one foot to two feet, from one foot to one hand, from two feet to two hands, etc. Still, the movement of the choir is symmetric, emphasizing the feet and shifting the body weight from one foot to the other, never changing the original position of the body. However, in the first scene the group had the body in asymmetry (to the right), hands in contact, feet guiding the movement, and the weight being transferred from one foot to the other, right-forwards and right-backwards.

Based on the Theme V of movement, the analysis of the first scene determined that the group only used the configuration "doing the same". On scene two, there were the configurations "dancing for the partner" (the acrobatics of the soloists); "dialogues in movement" (call and response, complimentary and canon sequences of the soloists); and "doing the same" (choir). The configuration "dancing together", "trios, quartets, and quintets" did not appear on this analysis.

The Ciranda Analysis

The Ciranda is one of the most accessible dances of the Brazilian popular culture because of its soft and

slow rhythm. We could translate some steps into “the wave”, “the small crunch”, and “jerky”.[4] The feet of the dancers always go to the right in the same four footsteps sequence, initiated by the left foot. Some variations include small jumps.

Pressing and dabing were the major actions made by the feet of the dancers. The jumps looked more like a dab than a thrust because they were soft and short. The trunk was twisted (wring) and during the jerky step, as the name indicated, all the body wasflicking. The arms sometimes, for example, in “the wave” step, can execute the basic action of slashing. Floating, gliding, and thrusting are actions that never occur during the Ciranda.

The weight of the dance is light because in general the movements are relaxed and neutral. Time is sustained. The space is directed to the right, right-forward, and right-backwards; the plan is high; the pathway is curve and extension varies from normal to near.

The action of the group is continuous; the flux is going; the control of the movements is normal; and the bodies are always in movement. The flow factor, then, is tending more for free than to be bound. This is confirmed by the analysis of the fundamental andbasic sensation of the movements: suspended and relaxed. The dance has few or no oscillation, even if there are variety of steps. But this observation was made on the popular Ciranda, and it would change if the Ciranda observed had been another composed specially for a stage presentation. A version composed for a folkloric purpose would include elements which could lead to very different analysis results. For this reason in this research, the objects of observation were traditional manifestation, created by people who danced on streets, squares, and yards.

Related to adaptation to a partner in the Ciranda only occurs “doing the same”. When the theme observed is body awareness, the conclusion is that the left foot is guiding the movements, the hands remain in contact, there is a shift of the weight of the body from the left to the right because of the direction. This shift leads to the asymmetry and emphasis in the left foot.

Cocos

It is necessary to adopt the plural when talking about this dance. Mario de Andrade, a relevant writer and researcher, after staying from 1928 to 1929 on the NorthEast of Brazil actually concluded that this dance needed to be mentioned in plural. The book containing his research was published in 1984 with the title *The Cocos*.[5] The main reason for this is the variation of ways of using musical instruments, plenty denominations, and diferent dances of coco.

Despite those variations, the cocos have two basic predominant effort actions of the feet: thrust and dab. The step also allows slashing feet and arms, flicking the entire body or parts of it, and wringing the trunk. The actions of glide, press, and float are never present.

The weight factor is strong; some gestures are restrained, but never smooth. The time factor is almost ever normal; some movements can be executed in a sudden way—some stomps, the “umbigadas”, and change of directions. There are movements in all directions: left, right, forwards, and backwards. This occurs because there are many changes of directions. The plan of the body of the dancers, as well as of the singers, is almost always medium. This plan can change to high very usually. They never use the low plan of the space factor. The extension of the movement is alterned in all possibilities: near, normal, and far. This happens because many kinds of choreographic compositions are allowed. Groups can dance together or apart, in rows, in pairs,

[4] “a onda”, “o machucadinho”, “sacudidinho”.
[5] “Os Cocos”.

dislocating ramdomly etc. Exactly because of this the pathway can be straight, angular, and curve.

General flow is bound during most of the time; flux varies between interrupting and arresting; action is jerky and stopped; control is normal, intermittent and complete; the bodies are in movement and in series of positions. These variations generate the fundamental sensation of dropping associated to the basic sensation stimulated.

Similar to the movements of the soloists of the "Homer Dance", in the coco the dancers stretch, bend, and twist the body. Also there is immobility and actions that are complementary and asymmetric. When they execute the "umbigada", their bodies are in contact because they touch their pelvis. The guidance of the movements is made by the right foot; the shift of the weight of the dancers is from the left to the right.

On the question adaptation to a partner the dancers of coco can do many variation. They dance "doing the same", when the dance is free and there is a tap dance where dancers imitate one another; they do "dialogue in movement", calling and responding, attacking and counter-attacking, combining turns; they "dance together" in the "umbigada" and pair dances; they "dance for the partner" when pairs goes to the center of the circle or between two rows; they dance in "trios, quartets, and quintets" in distinct formations with different combined choreographies during the dances.

Table 4

Choreoanalysis-Comparative Table

	Syrtós	**Homer Dance scene 1**	**Homer Dance scene 2**	**Cir and a**	**Coco**
Predominant basic effort actions	glide, dab	thrust, dab	dab	press, dab	thrust, dab
Other basic effort Actions	wring, slash, thrust, flick	-	wring, slash, thrust, glide	wring, slash, flick	wring, slash, flick
Absent basic effort actions	press, float	press, float	press, float, flick	thrust, float, glide	press, glide, float
Weight factor	light	strong	strong	light	strong
Time factor	sustained and normal	sudden	sudden and normal	sustained	normal and sudden
Space factor Direction	right right-forwards right-backwards	right right-forwards right-backwards	forwards	right right-forwards right-backwards	right, left, forwards, backwards
Space factor Plans	high	high	high, medium, low	high	high and low
Space factor Extensions	near (choir) normal (soloists)	normal	normal and far	normal and near	near, normal, and far
Space factor Pathways	curve	curve	straight	curve	straight, angular, and curve
Flow factor Flux	going (group) interrupting (feet)	interrupting	going, interrupting, and arresting (soloists) interrupting (choir)	going	interrupting and arresting
Flow factor Action	continuous (group) jerky (feet)	continuous (group) jerkyand onestopped (feet)	continuous, jerkye stopped (so list as) continuous (choir)	continuous	jerky and stopped
Flow factor Control	normal (choir) normal/intermitten t (soloists)	intermittent	normal, intermittent, and complete (soloists) complete (choir)	normal	normal, intermittent, and complete

(Table 4 continued)

	Syrtós	Homer Dance scene 1	Homer Dance scene 2	Cir and a	Coco
Flow factor Body	motion	motion	position, motionandseries of positions (soloists) position (choir)	motion	motion e series of positions
General flow	bound	bound	free (soloists) bound (choir)	free	bound
Fundamental sensations of the movements	levity/lightness	dropping	dropping	levity/ lightness	dropping
Fundamental sensations of the movements	relaxed	stimulated	stimulated	relaxed	stimulated
Theme I of the movements Body awareness	foot guides the movement; hands in contact; shift of the weight of the body from the left to the right; asymmetry.	foot guides the movement; hands in contact; transferência de shift of the weight of the body from the left to the right; asymmetry.	stretch, bend, and twist the body; immobility; actions that are complementary and asymmetric arms in contact; varied shift of the weight of the body (soloists). symmetry; foot guides the movement; simple shift of the weight of the body; (choir)	foot guides the movement; hands in contact; shift of the weight of the body from the left to the right; asymmetry.	stretch, bend, and twist the body; immobility; Varied actions; right foot guides the movement; the body parts in contact are the hips (umbigada); asymmetry; simple shift of the weight of the body.
Theme V of the movements Adaptation to a partner	doing the same; dancing together; dancing for partner.	doing the same.	doing the same (choir); dancing for partner; dialogues in movement (soloists).	doing the same.	doing the same; dialogues in movement; trios, quartets, quintets; dancing together; dancing for partner.

Conclusion

As documents of aural events, remaining texts of Ancient Greek Dramas present different kinds of organization of sound data.

Metrical design is one of them. It indicates play structure, body movements at stage, vocal performances, and instrumental rhythmic guides. There are more aural events than speech communication: choreographic activities (steps, clapping hands, body percussion, vocal percussion, and so on) and accompanying musical instruments. And all of them are replied by sometimes noisy audience, projecting into the acoustic space of the theatre a shared and collective sound experience.

The aim of this paper is to introduce a methodological approach capable of contextualizing the performative aspects of Greek meter in order to subsidize further propositions of new objects and researches in Music of Ancient Theatre.

So as to do that I present a metrical analysis of the opening anapaests of Aeschylus's *The Suppliants* and a choreographic and percussive reconstruction of it. Tensions between metrical and tonal accents generate aural distinctions that inform choral performances, producing links between beats and bits: Sequences of weak and

strong syllables manipulate psychoacoustic parameters by accumulation of temporal and loudness modulation. Choral performances organize sound that occurs at the same time and in sequences.

According to Aristotle, sound production and reception are connected to percussive gestures: Actual sound requires something that strikes and something being struck (Aristotle, 1979).

This preliminary aural phenomenology projects movement and bodies in contact as determinants of sound events.

The chorus activity of ancient Greek dramas presents the elements described by Aristotelian sound phenomenology: An ancient Greek chorus is a group of bodies that interacts with itself and with the audience producing many sounds.

There are two basic paths to follow in order to access this chorus sonority: following sound references raised in the content of the play or analyzing the play's metrical design. In this paper, my focus centers in the latter path.

In order to do that, let us proceed to a close reading of the first entrance of the Chorus (parodos) in Aeschylus's *The Suppliants* and its aural simulation.

Aeschylus' *The Suppliants* opens with a chorus of women fleeing to escape a forced marriage. They arrive at Argos seeking for refuge. The first part of the parodos is organized in recitative anapaests.

Based on contrastive duration (long, short), the anapaests systems are associated with physical movements of choruses in their entrances and exits. Their time ratio exhibits a balanced proportion 2:2—two moras (a long or two shorts). Each syllable has a temporal profile. Regular and recurrent time expresses regular and coordinated movements.

But duration is just one of multiple aspects of metrical design: tonal accents marks volume, intensity, adding new values to physical actions on stage.

Thus temporal regularity (pulse) is redefined by accent variation. Time and intensity marks are non simultaneous phenomena. The asynchrony between time patterning and intensity is exploited in the text to display the suppliants' ambivalences. In musical notation, non-coincidence of time and intensity is better represented as follows.

When these sound files are listened to, it is possible to perceive how anapaestic rhythm is organized by tension between convergent and divergent orientations. In *The Suppliants* the contrast between recurrent time and non-coincidental time and accents movement amplifies not only the ambivalence of the character's situation (rape vs. salvation), but also the character's ambivalence (object of violence vs. inflict violence). To the audience this ambivalence is proposed since the beginning of the play by acoustic procedures. Listening up to metrical and accent relationship simulated by sound files is an alternative to interpret aural experience of an ancient Greek tragedy.

After that is necessary go beyond sound simulation. Because, as sound in classical era has a percussive and bodily definition, sound files should be connected to performative contexts.

In two experiments, I have submitted *The Suppliants* parodos' sound files to dance students in order to see how they answer to aural *stimuli*. In the first experiment, dance students were exposed only to sound, without any knowledge about Aeschylus's play. They were asked to answer physically to sound files. And they have performed a march: In line, they walked as a military group, as the suppliants called themselves, *stólon... váion.* So knowing just rhythms, they were able to connect sound and movement in embodied performances. Of course, they did not dance the same choreography that was danced centuries ago. But they faced on the same

situation using the same method. Exposed to organized sound, they have produced organized movements.

In the second experiment, dance students could read the text using information about the play. After this preliminary stage of instruction, they were asked to perform again an exercise based on what they learnt about *The Suppliants* and the sound files. The results were totally different. There were no marches, but just stylized movements based on contemporary dance aesthetics. They were more interested in the visual than aural dimension of the performance.

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